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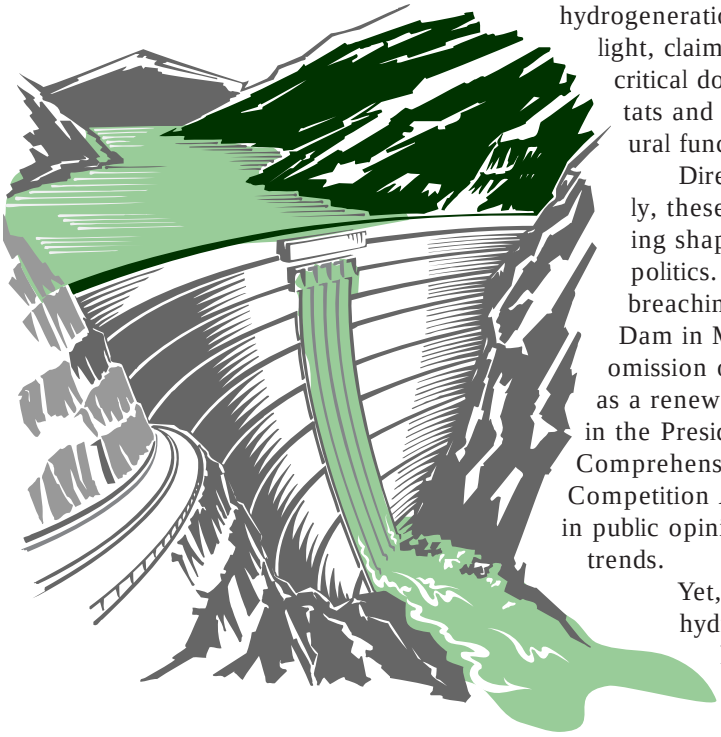
Hydropower: Changing environmental challenges into opportunities

by Bill Karsell

Hydropower has long been viewed as a comparatively low-cost, environmentally friendly source of power. But this view is changing. Many people, particularly environmentalists, increasingly cast hydrogeneration in a negative light, claiming dams harm critical downstream habitats and disrupt the natural functions of rivers.



Directly or indirectly, these views are helping shape policies and politics. The recent breaching of Edwards Dam in Maine and the omission of hydro-power as a renewable re-source in the President's proposed Comprehensive Electricity Competition Act signal shifts in public opinion and political trends.

Yet, the future for hydropower doesn't have to be bleak. The environmental challenges facing the industry can be turned into opportunities. How we respond during the next 10 years will determine hydropower's future.

Challenges faced

Three challenges facing the hydropower industry are threatened and endangered species, the deteriorating image of hydropower and the fact that dam operations are the easiest river habitat component to manage.

Threatened and endangered species—When species that depend on habitats below hydrogeneration projects become threatened or endangered, people often assume dam operations are to blame. They believe changes in water temperature and fluctuating flows are the direct cause of species decline.

Certainly, dams profoundly change surrounding habitats, but they also provide benefits, such as low-cost power, flood control, water for irrigation and recreation. And dams and hydrogeneration may not be the only cause of declining species. Irrigation and urban runoff, industrial discharge, channel modifications and exotic species may also be contributing factors.

Threatened and endangered species, then, raise two important questions:

- Are dams and hydrogeneration the only reason for environmental stress, or are other factors at play as well?
- How do we balance the health of species and habitats with the benefits of dams and hydropower?

Image—In past years, the image of low-cost, clean hydropower has changed just as people's views on environmental issues have changed. Today, many people no longer view rivers as workhorses to be harnessed for power, but instead, as essential elements of larger, regional ecosystems. They believe rivers should be restored, even if it means purchasing alternative energy at slightly higher rates. In addition, increasingly available nonhydro renewables, with fewer environmental issues, challenge hydropower as the preferred renewable.

Does this mean hydropower should be written out of the picture? Certainly not. Like other energy sources, hydrogeneration should be part of the nation's energy portfolio. But what hydropower's role will be in the future needs to be better defined.

Dam operations—Many people point to dam operations as the source of environmental problems because they are more obvious and are the easiest to manipulate. Identifying problems such as point and nonpoint discharges, stream-channel modifications and introduced exotic species is far more complicated. And correcting these problems is more difficult since it often involves reshaping human behavior and longstanding business practices.

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And what about the tradeoffs? Environmentally based restrictions on Glen Canyon Powerplant operations reduced generation capacity from 1,300 MW to about 800 MW. Rates went up and several river species remain endangered. Did this short-term solution achieve the desired goal?

Opportunities to be seized

To respond to these challenges, hydropower supporters must seize opportunities to change public and political opinions and find ways to balance healthy river systems and the growing need for renewable power.

Broaden the scope of environmental issues—First, we need to take the spotlight off dams and examine all factors involved. How do logging or agricultural runoff affect the system? What influences do development and recreation have? Should the hydropower industry be solely responsible for the cost of ecosystem restorations? Or should the cost be shared among all players involved?

Promoting healthy habitats

Discredit the assumption that natural flow is best—In most cases, returning a river to its natural state is not feasible. We have been modifying Western rivers for more than a century. Returning a river to predevelopment conditions would require much more than just re-regulating flows.

Rather than debating what constitutes "natural," the objective should be promoting healthy habitats and helping declining species recover. Undeniably, these would be managed systems. But they would be managed for multiple, sustainable, long-term purposes—including hydropower.

Build local stakeholders coalitions to manage local resources—Restoring an ecosystem is too large a task for any one entity. Building partnerships among all stakeholders—environmentalists, various industries, Federal and state agencies and local communities—is essential. Together, these entities must find common ground that will yield long-term solutions for complex problems.

As part of the hydropower industry, we must become partners in environmental protection and restoration to earn credibility in stakeholder processes. The sooner we begin collaborating, the more options we will have. Waiting until a fish species below one of our projects becomes endangered forecloses options.

The challenges are before us. Let us now seize the opportunities.

(Note: Karsell is an environmental manager in Golden. The opinions expressed in this article are Kar-sell's own and do not represent official agency policy.)

Shasta Dam, on the Sacramento River near Redding, Calif., changed the landscape of the valley above it with the creation of Shasta Lake, which holds 4.5 million acre-feet of water. The dam controls floodwaters and stores water for downstream use including irrigating crops, maintaining navigation flows, assisting migrating salmon, protecting the Sacramento-San Juan Delta from saltwater intrusion and generating hydropower.